



## **Removal of Alizarin Red S from Aqueous Solutions by Adsorption Using Activated Carbons Prepared from Walnut Shell**

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**Abstract:** In this study, the ability of walnut shell activated carbons (WSAC), to remove dye (Alizarin Red S) from aqueous solution by adsorption was investigated. Experiments were conducted at 25 °C to study the effects of pH and initial concentration of Alizarin Red S (ARS). Equilibrium adsorption isotherms and kinetics were investigated. The experimental data were analyzed by the Langmuir, Freundlich, Dubinin-Kaganer-Radushkevich (DKR) and Temkin models of adsorption. The adsorption isotherm data were fitted well to Langmuir isotherm and the monolayer adsorption capacity was found to be 18.05 mg/g at 25 °C. The kinetic data obtained at 20 mg/L concentration have been analyzed using a pseudo-first-order and pseudo-second-order equation. The experimental data fitted very well the pseudo-second-order kinetic model.

**Keywords:** *Alizarin Red S; Active Carbon; Walnut Shell; Adsorption isotherm; Equilibrium; Kinetics*

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